IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): An image reading device comprising:

a photoelectric device including a plurality of pixels and provided with an empty transfer part, the empty transfer part outputting an empty transfer level corresponding to black dummy pixels which are always shaded and are not used for reading an image;

an A-D converter performing A-D conversion on an output signal for each pixel of said photoelectric device;

a reference voltage varying part varying a reference voltage of said A-D converter to vary between first, second, and third reference voltages based on a current mode of an image scanner, the first reference voltage selected for a background removal function, and one of the second and third reference voltages being selected when the background removal function is not used;

a detecting part detecting a black correction reference data from an output signal for each pixel of said photoelectric device;

a black shading correcting part subtracting the black correction reference data from digital image data obtained from the output signal for each pixel of said photoelectric device when an image is read, through said A-D converter having the reference voltage set therein; and

a correcting part correcting the black correction reference data by a ratio between a first digital black level value obtained from an output voltage level of said empty transfer part obtained through said A-D converter when the black correction reference data is detected and a second digital black level value obtained from an output voltage level of said empty transfer part obtained through said A-D converter when the image is read.

Claim 2 (Currently Amended): An image reading device comprising:

a photoelectric device including a plurality of pixels and an empty transfer part, the empty transfer part outputting an empty transfer level corresponding to black dummy pixels which are always shaded and are not used for reading an image;

an empty transfer part output generating part falsely generating an output of the empty transfer part of said photoelectric device by outputting a predetermined voltage at a predetermined timing;

an A-D converter performing A-D conversion on an output signal for each pixel of said photoelectric device;

a reference voltage varying part varying a reference voltage of said A-D converter to vary between first, second, and third reference voltages based on a current mode of an image scanner, the first reference voltage selected for a background removal function, and one of the second and third reference voltages being selected when the background removal function is not used;

a detecting part detecting a black correction reference data from an output signal for each pixel of said photoelectric device;

a black shading correcting part subtracting the black correction reference data from digital image data obtained from the output signal for each pixel of said photoelectric device when an image is read, through said A-D converter having the reference voltage set therein; and

a correcting part correcting the black correction reference data by a ratio of a first digital black level value obtained from an output voltage level of said empty transfer part output generating part obtained through said A-D converter when the black correction reference data is detected and a second digital black level value obtained from an output

voltage level of said empty transfer part output generating part obtained through said A-D converter when the image is read.

Claim 3 (Original): The image reading device as claimed in claim 1, wherein said photoelectric device comprises a unity magnification contact-type sensor which receives reflected light from an original through a unity magnification optical system.

Claim 4 (Original): The image reading device as claimed in claim 2, wherein said photoelectric device comprises a unity magnification contact-type sensor which receives reflected light from an original through a unity magnification optical system.

Claim 5 (Original): The image reading device as claimed in claim 1, wherein said correcting part comprises:

a first adding circuit calculating a sum of output levels of said empty transfer part for predetermined pixels obtained when the black correction reference data is detected;

a second adding circuit calculating a sum of output levels of said empty transfer part for the predetermined pixels obtained when the image is read;

a multiplying circuit multiplying the sum output from said second adding circuit with the black correction reference data;

a dividing circuit dividing the result of multiplication output from said multiplying circuit by the sum output from said first adding circuit, and outputting the result of the division as the black correction reference data after the correction.

Claim 6 (Previously Presented): The image reading device as claimed in claim 2, wherein said correcting part comprises:

a first adding circuit calculating a sum of false output levels of said empty transfer part from said empty transfer part output generating part for predetermined pixels obtained when the black correction reference data is detected;

a second adding circuit calculating a sum of false output levels of said empty transfer part from said empty transfer part output generating part for the predetermined pixels obtained when the image is read;

a multiplying circuit multiplying the sum output from said second adding circuit with the black correction reference data;

a dividing circuit dividing the result of multiplication output from said multiplying circuit by the sum output from said first adding circuit, and outputting the result of the division as the black correction reference data after the correction.

Claim 7 (Previously Presented): The image reading device as claimed in claim 1, wherein said correcting part comprises:

a first adding circuit calculating a sum of output levels of said empty transfer part for predetermined pixels obtained when the black correction reference data is detected;

a second adding circuit calculating a sum of output levels of said empty transfer part for the predetermined pixels obtained when the image is read;

a microcomputer multiplying the sum output from said second adding circuit with the black correction reference data and dividing the result of the multiplication by the sum output from said first adding circuit, and outputting the result of the division as the black correction reference data after the correction.

Claim 8 (Previously Presented): The image reading device as claimed in claim 2, wherein said correcting part comprises:

a first adding circuit calculating a sum of false output levels of said empty transfer part from said empty transfer part output generating part for predetermined pixels obtained when the black correction reference data is detected;

a second adding circuit calculating a sum of false output levels of said empty transfer part from said empty transfer part output generating part for the predetermined pixels obtained when the image is read;

a microcomputer multiplying the sum output from said second adding circuit with the black correction reference data and dividing the result of the multiplication by the sum output from said first adding circuit, and outputting the result of the division as the black correction reference data after the correction.

Claim 9 (Original): An image forming apparatus comprising: the image reading device claimed in claim 1; and

an image forming device forming an image on a sheet based on the image data read by said image reading device.

Claim 10 (Original): An image forming apparatus comprising: the image reading device claimed in claim 2; and

an image forming device forming an image on a sheet based on the image data read by said image reading device.

Claim 11 (Currently Amended): An image reading device comprising:

photoelectric means including a plurality of pixels and provided with an empty transfer part, the empty transfer part outputting an empty transfer level corresponding to black dummy pixels which are always shaded and are not used for reading an image;

A-D converting means for performing A-D conversion on an output signal for each pixel of said photoelectric means;

reference voltage varying means for varying a reference voltage of said A-D converting means to vary between first, second, and third reference voltages based on a current mode of an image scanner, the first reference voltage selected for a background removal function, and one of the second and third reference voltages being selected when the background removal function is not used;

detecting means for detecting a black correction reference data from an output signal for each pixel of said photoelectric means;

black shading correcting means for subtracting the black correction reference data from digital image data obtained from the output signal for each pixel of said photoelectric means when an image is read, through said A-D converting means having the reference voltage set therein; and

correcting means for correcting the black correction reference data by a ratio a first digital black level value obtained from of an output voltage level of said empty transfer part obtained through said A-D converting means when the black correction reference data is detected and a second digital black level value obtained from an output voltage level of said empty transfer part obtained through said A-D converting means when the image is read.

Claim 12 (Currently Amended): An image reading device comprising:

photoelectric means including a plurality of pixels and an empty transfer part, the empty transfer part outputting an empty transfer level corresponding to black dummy pixels which are always shaded and are not used for reading an image;

empty transfer part output generating means for falsely generating an output of the empty transfer part of said photoelectric means by outputting a predetermined voltage in predetermined timing;

A-D converting means for performing A-D conversion on an output signal for each pixel of said photoelectric means;

reference voltage varying means for varying a reference voltage of said A-D converting means to vary between first, second, and third reference voltages based on a current mode of an image scanner, the first reference voltage selected for a background removal function, and one of the second and third reference voltages being selected when the background removal function is not used;

detecting means for detecting a black correction reference data from an output signal for each pixel of said photoelectric means;

black shading correcting means for subtracting the black correction reference data from digital image data obtained from the output signal for each pixel of said photoelectric means when an image is read, through said A-D converting means having the reference voltage set therein; and

correcting means correcting the black correction reference data by a ratio of a first digital black level value obtained from an output voltage level of said empty transfer part output generating means obtained through said A-D converting means when the black correction reference data is detected and a second digital black level value obtained from an output voltage level of said empty transfer part output generating means obtained through said A-D converting means when the image is read.

Claim 13 (Original): The image reading device as claimed in claim 11, wherein said photoelectric means comprises a unity magnification contact-type sensor which receives reflected light from an original through a unity magnification optical system.

Claim 14 (Original): The image reading device as claimed in claim 12, wherein said photoelectric means comprises a unity magnification contact-type sensor which receives reflected light from an original through a unity magnification optical system.

Claim 15 (Original): The image reading device as claimed in claim 11, wherein said correcting means comprises:

first adding means for calculating a sum of output levels of said empty transfer part for predetermined pixels obtained when the black correction reference data is detected;

second adding means for calculating a sum of output levels of said empty transfer part for the predetermined pixels obtained when the image is read;

multiplying means for multiplying the sum output from said second adding means with the black correction reference data;

dividing means for dividing the result of multiplication output from said multiplying means by the sum output from said first adding means, and outputting the result of the division as the black correction reference data after the correction.

Claim 16 (Previously Presented): The image reading device as claimed in claim 12, wherein said correcting means comprises:

first adding means for calculating a sum of false output levels of said empty transfer part from said empty transfer part output generating means for predetermined pixels obtained when the black correction reference data is detected;

second adding means for calculating a sum of false output levels of said empty transfer part from said empty transfer part output generating means for the predetermined pixels obtained when the image is read;

multiplying means for multiplying the sum output from said second adding means with the black correction reference data;

dividing means for dividing the result of multiplication output from said multiplying means by the sum output from said first adding means, and outputting the result of the division as the black correction reference data after the correction.

Claim 17 (Previously Presented): The image reading device as claimed in claim 11, wherein said correcting means comprises:

first adding means for calculating a sum of output levels of said empty transfer part for predetermined pixels obtained when the black correction reference data is detected;

second adding means for calculating a sum of output levels of said empty transfer part for the predetermined pixels obtained when the image is read;

a microcomputer multiplying the sum output from said second adding means with the black correction reference data and dividing the result of the multiplication by the sum output from said first adding means, and outputting the result of the division as the black correction reference data after the correction.

Claim 18 (Previously Presented): The image reading device as claimed in claim 12, wherein said correcting means comprises:

first adding means for calculating a sum of false output levels of said empty transfer part from said empty transfer part output generating means for predetermined pixels obtained when the black correction reference data is detected;

second adding means for calculating a sum of false output levels of said empty transfer part from said empty transfer part output generating means for the predetermined pixels obtained when the image is read;

a microcomputer multiplying the sum output from said second adding means with the black correction reference data and dividing the result of the multiplication by the sum output from said first adding means, and outputting the result of the division as the black correction reference data after the correction.

Claim 19 (Original): An image forming apparatus comprising: the image reading device claimed in claim 11; and

image forming means for forming an image on a sheet based on the image data read by said image reading device.

Claim 20 (Original): An image forming apparatus comprising: the image reading device claimed in claim 12; and

image forming means for forming an image on a sheet based on the image data read by said image reading device.